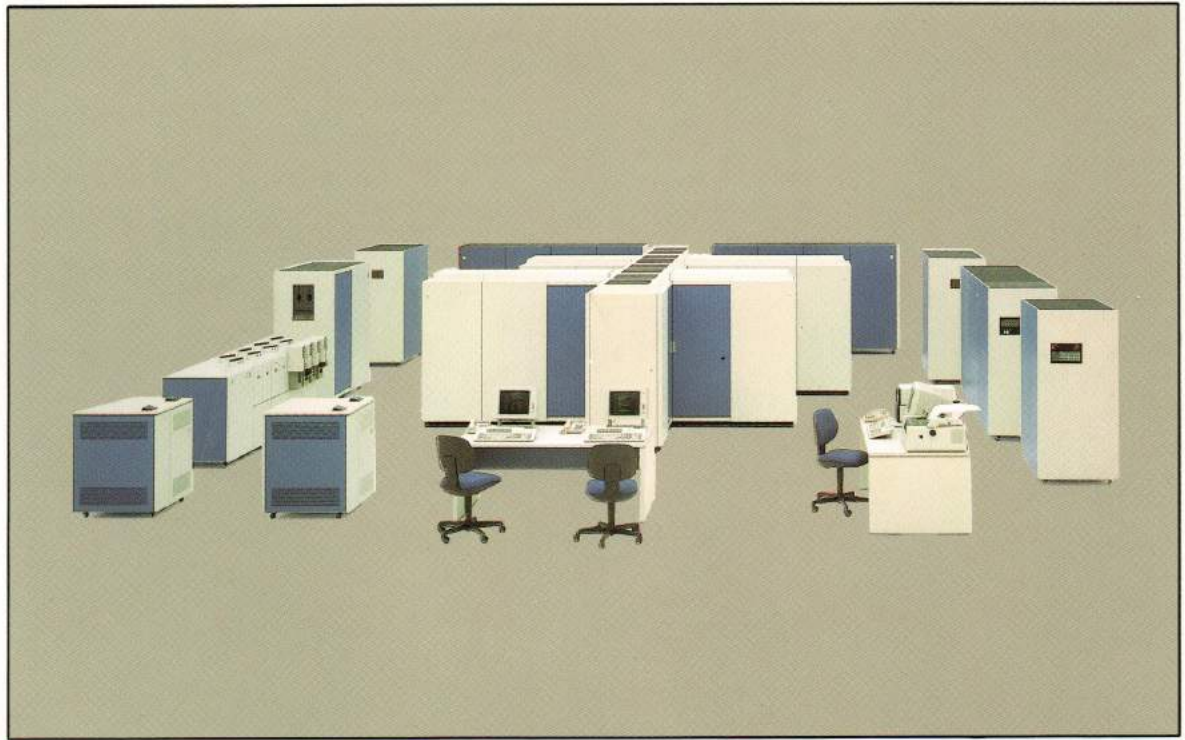
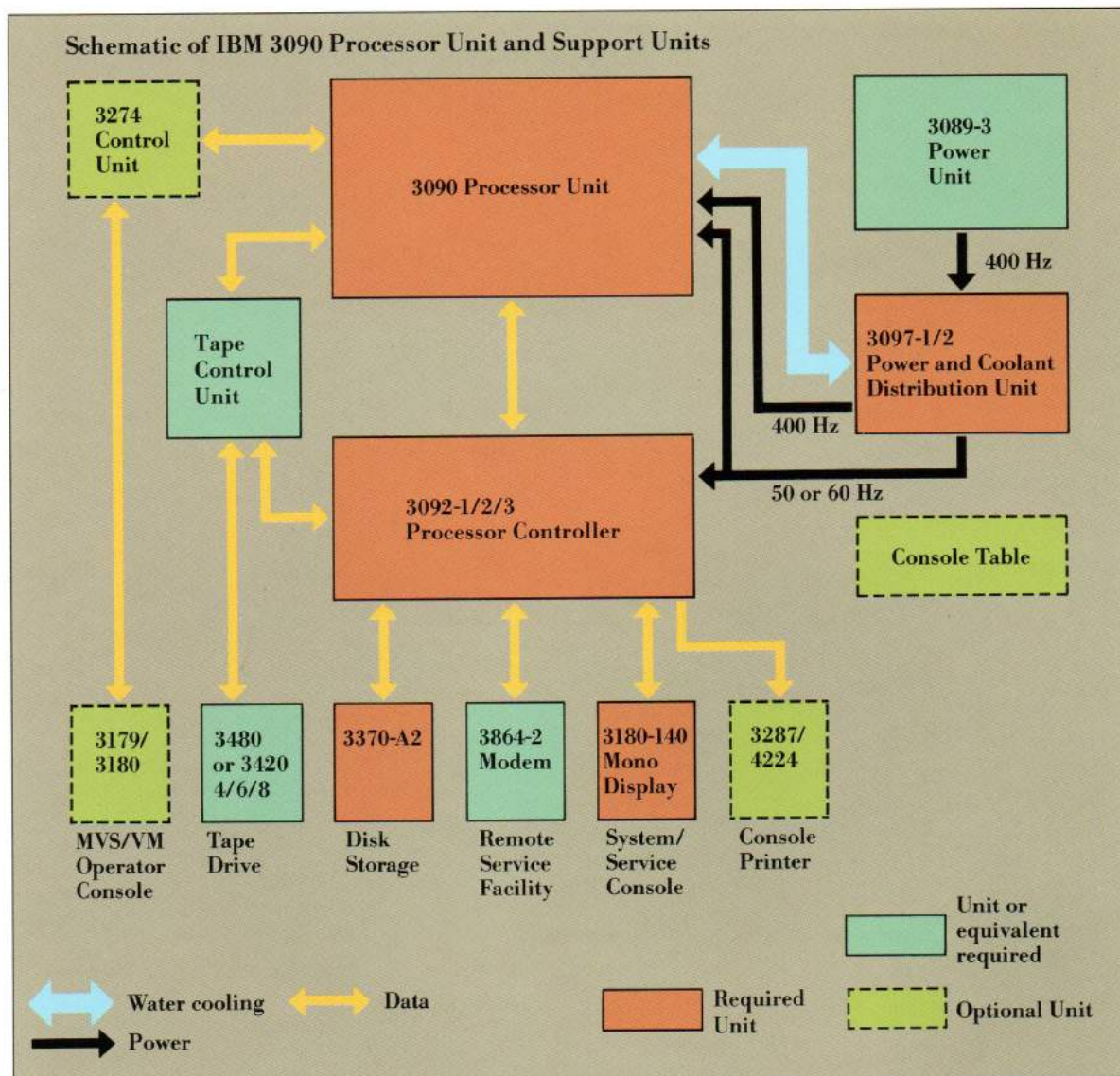


IBM 3090 Processor Complex Support Units





IBM 3090 Processor Complex Support Units

The IBM 3090 Processor Complex is the most powerful IBM computing system available. The IBM 3090 Processor Unit performs the data processing functions of the system. It is supported by a number of required or optional units, which are described in this publication.

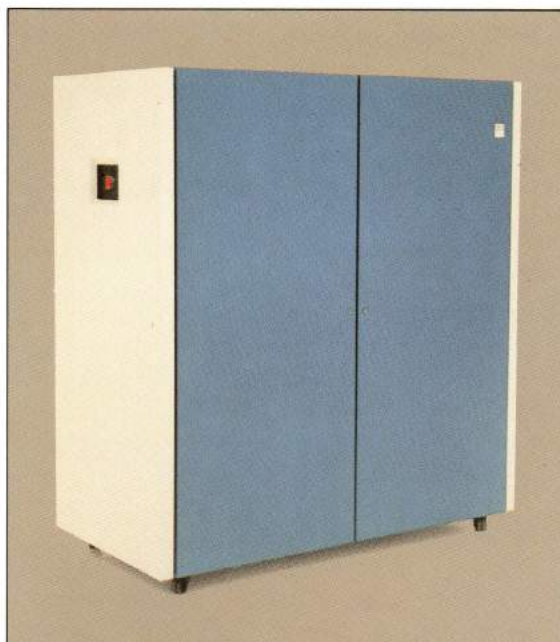
The quantity required of each support unit depends on the model of the IBM 3090 Processor Unit. Outline configuration details are provided in the IBM 3090 Processor Unit publication G511-0133. Further information may be obtained from the IBM manuals listed at the end of this publication.

Required Unit Types:

- IBM 3089 Power Unit (or equivalent).
- IBM 3092 Processor Controller.
- IBM 3097 Power and Coolant Distribution Unit.
- IBM 3180 Display Station as system/service console.
- IBM 3370 Direct Access Storage Device.
- IBM 3864 Modem (or equivalent) with autocall/autoanswer feature.
- Access to IBM 3480 Magnetic Tape Subsystem or IBM 3420 Tape Drive, 6250 bits per inch (or equivalent).

Optional Units:

- IBM 3179/3180 Display Station (or equivalent) channel-attached operator console for communication with system control program.
- IBM 3287 or 4224 Printer.
- IBM Console Table.



IBM 3089 Model 3 Power Unit

The 3089 contains a motor generator and it, or an equivalent device, provides 400 Hz power to the IBM 3097 Power and Coolant Distribution Unit from which it is distributed to the different frames of the IBM 3090 Processor Unit.

Highlights include:

- Designed for location in the computer room, with the same colour options and low noise characteristics as the IBM 3090 Processor Unit,
- Installed by IBM together with the rest of the 3090 Processor Complex, simplifying initial installation.
- Can be maintained by IBM, helping to assure the high availability of the 3090 system, which depends on the correct functioning of the power source for the IBM 3090 Processor Unit.



IBM 3097 Model 1.

IBM 3097 Power and Coolant Distribution Unit

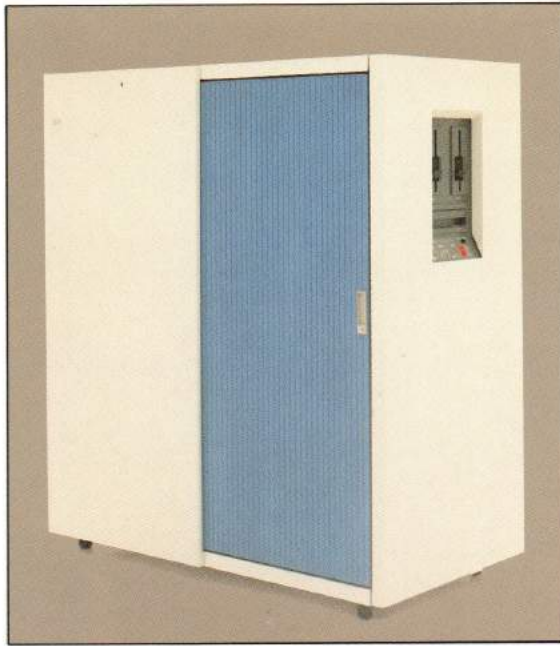
The IBM 3097 Power and Coolant Distribution Unit provides the combined functions of power distribution to the 3090 Processor Complex and water cooling to the IBM 3090 Processor Unit. The Model 1 differs from the Model 2 by providing Input/Output Power Sequence and Control (IOPS) capability. The more compact and less expensive Model 2 can be field upgraded to the Model 1 in five hours, plus the time required to connect IOPS cables.

Power Distribution:

- Obtains power from the IBM 3089 Model 3 Power Unit or equivalent 400 Hz power source.
- Distributes 400 Hz power to the IBM 3090 Processor Unit and 50 or 60 Hz power to the IBM 3092 Processor Controller and the IBM 3090 Processor Unit.
- IBM 3097 Model 1 can power on and off up to 64 control units and, if configured with the optional Power Sequence Control feature, up to 128 control units.

Coolant Distribution:

- Controls the temperature and flow rates of an IBM-supplied closed-loop distilled water cooling system used to cool the Thermal Conduction Modules in the IBM 3090 Processor Unit.
- Pumps the water in the closed-loop system through a heat exchanger in the 3097 where customer-supplied chilled water from an external source absorbs the heat.
- Contains a duplicate pump for the closed-loop cooling system which automatically takes over from the operating pump if it fails.



IBM 3092 Processor Controller

The IBM 3092 Processor Controller Models 1, 2 and 3 monitor and control the status of all physical units within a 3090 Processor Complex.

The Models 1 and 2 contain duplicate processors and are supported by duplicate 3370 Direct Access Storage Devices often permitting the Processor Controller to continue operation after a component failures.

All models of 3092 perform similar functions. These are:

Device Attachment for:

- Required and optional 3180 system and service consoles.
- 3370 Direct Access Storage Devices.
- 3864 Modem or equivalent.
- Optional Console Printer.

System Initialisation and Control:

- Power on and power off of all 3090 Processor Complex units and all control units which are under 3097 power sequence control.
- Initial Microcode Load (IML) and Initial Program Load (IPL) of the IBM 3092 Processor Controller and IML of the IBM 3090 Processor Unit.
- Validation of error-free data locations in Central Storage and recording of failing storage locations.
- System configuration for System/370 or System/370 Extended Architecture mode of operation.

Monitoring and Error Logging:

- Collection of information for up to 24 system activity displays including central processor and channel utilisation.
- Monitoring of voltage levels and coolant flow rate.
- Logging of errors, failures and status information relating to Processor Complex and I/O problem determination.

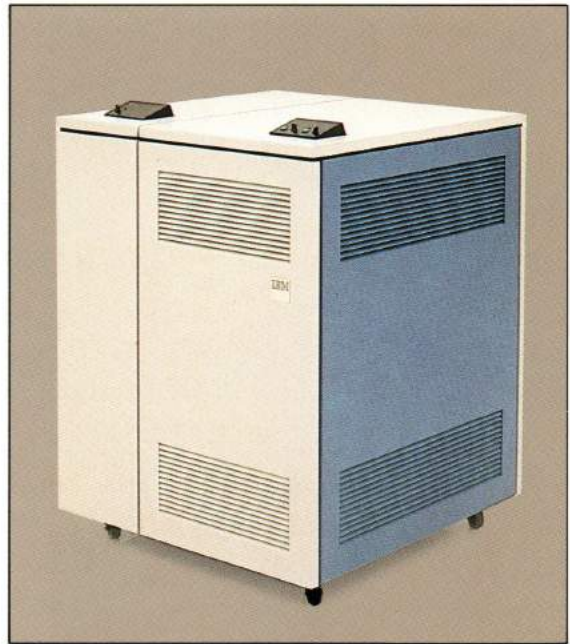
Error Recovery, Fault Diagnosis and Service Support:

- Automatic error recovery where possible, such as the activation of the duplicate water pump in the 3097.
- Automatic identification of the failing field replaceable unit, at times concurrent with 3092 and 3090 operation.
- Operator alert for non-recoverable failures or failures which exceed a threshold.
- Interactive Customer Problem Analysis for problem determination and immediate recovery when feasible.
- Reconfiguration of Central Storage, Expanded Storage, Vector Facilities, Central Processors and online channels to bypass failures.
- Remote Service Facility to permit immediate fault diagnosis by remote IBM specialists using a dial-up link.

IBM 3864 Model 2 Modem

The IBM 3864 Model 2 Modem with an Autocall Unit feature, or an equivalent device, is required to permit access by the IBM 3092 Processor Controller to IBM's Remote Service Facility (RSF) which is used for remote service updating as well as remote fault diagnosis.

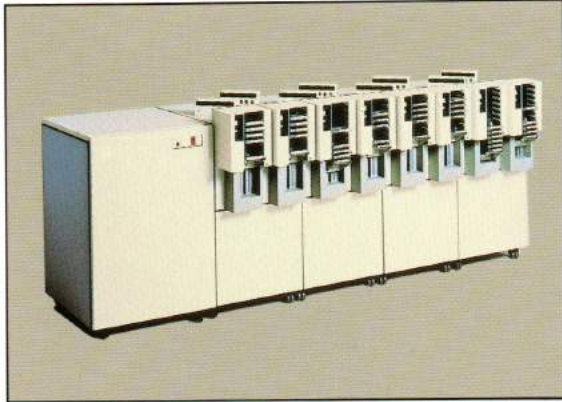
- The 3864 permits data transmission at 4800 bits per second on a switched telephone network.
- Autocall Unit feature permits automatic dialling to or from the IBM remote service location.
- No incoming or outgoing calls are permitted without customer authorisation and manual instead of automatic dial up can be used if required.
- Details of all calls are recorded and each call is listed on a Remote Service Facility (RSF) log index which can be displayed.
- Once the link is established, an IBM specialist can run diagnostics remotely.



IBM 3370 Direct Access Storage Device

One or two IBM 3370 Model A02 Direct Access Storage Devices are used to provide storage for the IBM 3092 Processor Controller:

- Each 3370 has its own control unit and can store up to 730 Megabytes.
- Each 3370 is connected, by means of a string switch feature, to both processors in the 3092.
- The 3370s are used to store microcode for the 3092 and 3090 together with system Input/Output configuration information, diagnostics and the error logs used by service personnel.
- In normal single image operation, when two 3370s are configured, one 3370 is active and the other provides backup. Essential information is duplicated on both 3370s so that the backup processor in the 3092 Model 1 or 2 and the backup 3370 can take over at any time.



IBM 3480 Magnetic Tape Subsystem and IBM 3420 Model 4/6/8 Tape Drive

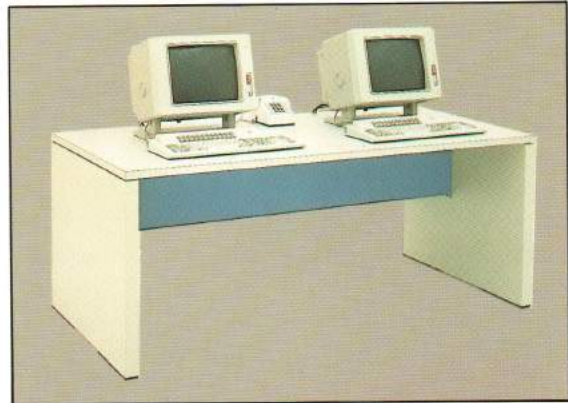
Access is required by the IBM 3092 Processor Controller to a tape drive to install microcode and diagnostics, to apply engineering changes and to reload the IBM 3370 Direct Access Storage Devices, if necessary. This is provided by:

- Access to a channel path to an IBM 3480 Tape Drive (or equivalent using 38K bits per inch cartridges) or an IBM 3420 Model 4, 6 or 8 Tape Drive (or equivalent using 6250 bits per inch tapes).
- In the case of an IBM 3090 Model 400E or 600E, access to a tape control unit must be provided from each processor in the IBM 3092 Model 2.
- Maximum distance between the tape drive and the IBM 3092 is:
 - 122 m (400 feet) for an IBM 3480,
 - 61m (200 feet) for an IBM 3420 Model 4 or 6 extendable by RPQ to 107 m (350 feet),
 - 22 m (72 feet) for an IBM 3420 Model 8.

IBM 3180 Model 140 Display Station

The IBM 3180 Model 140 Display Station is a monochrome unit used to perform multiple console roles in a 3090 Processor Complex.

- The IBM 3092 Processor Controller can support up to six physical 3180 consoles, required and optional. The quantity of required consoles depends on the model of the IBM 3190 Processor Unit.
- Each 3180 can be used logically as a system console, service console, programming support console, system console monitor or service console monitor.



- Any physical display attached to 3092 can be given multiple logical console functions, which may be re-assigned as required.
- The service support display must be located within 10 metres (33 feet) of the 3092. Other displays can be located up to 1500 metres (4921 feet) away.

Optional Units

A number of optional units may be attached to the 3090 Processor Complex. These include:

IBM 3179 and IBM 3180 Displays

According to user needs, IBM 3179 colour and IBM 3180 Model 1 monochrome displays, or other supported devices, may be channel-attached via an IBM 3274 Control Unit for use as MVS or VM operator consoles.

IBM 3287 and 4224 Printers

Up to two optional console printers can be attached to the IBM 3092 Processor Controller.

Four models are supported for copying console display images:

- IBM 3287 Model 1, 80 characters per second,
- IBM 3287 Model 2, 120 characters per second,
- IBM 4224 Model 201, 250 characters per second,
- IBM 4224 Model 202, 400 characters per second.

Console Table

The IBM console table provides an optional operator workstation for one or two operators and their display consoles.

Physical Characteristics

This information is provided for comparison purposes only. The IBM Installation Manual

Physical Planning, GC22-7074, should be used for detailed planning.

| Product | 3089 Power Unit | 3097 Power and Coolant Distribution Unit | | 3092 Processor Controller | | 3370 Direct Access Storage Device | 3180 Display Station | Console Table |
|---|--|---|----------------------------------|---------------------------------|------------------------|---|----------------------------|------------------|
| | | Model 1 | Model 2 | Model 1/2 | Model 3 | | | |
| Height: Metres Inches | 1.79 70.5 | 1.79 70.5 | 1.79 70.5 | 1.79 70.5 | 1.79 70.5 | 1.00 39.5 | 0.37-0.52 14.5-20.5 | 0.72 28.5 |
| Length: Metres Inches | 1.64 64.5 | 3.165 124 | 2.34 92 | 1.615 63.5 | 1.615 63.5 | 0.775 30.5 | 0.435 17 | 1.78 70 |
| Depth: Metres Inches | 0.815 32 | 0.815 32 | 0.815 32 | 0.815 32 | 0.815 32 | 0.815 32 | 0.36 14.25 | 0.90 35.5 |
| Space including service clearances: Sq M Sq Ft | 8.64 93.04 | 12.59 135.5 | 10.62 114.3 | 8.86 95.4 | 8.86 95.4 | 5.40 58.11 | — — | 4.54 48.85 |
| Weight: Kg Lb | 1 075 2 370 | 1 309 2 885 | 1 172 2 585 | 795 1 750 | 704 1 550 | 260 580 | 22.25 49 | 85 190 |
| Heat Output: — To Air Watts BTU / Hr — To Water Watts BTU / Hr | 3 000-7 000 10 242-23 900 — — | 1 050 3 550 1 650 5 650 | 1 050 3 550 1 650 5 650 | 1 750 6 000 — — | 960 3 277 — — | 640 2 190 — — | 85 300 — — | — — — — |
| Airflow: M ³ / Min CFM | 11.50 400 | 3.70 130 | 3.70 130 | 34.41 1 220 | 18.21 643 | 5.50 190 | Convection Convection | — — |
| Power consumption: Watts KVA | 3 000-7 000** 6.5-2.5*** | * * | * * | * * | * * | 640 0.92 | 85 0.14 | — — |

Requirements for operating environment temperature, relative humidity and maximum wet bulb are similar to those for the IBM 3090 Processor Unit which are supplied in the companion publication reference G 511-0133.

*Included with IBM 3090 Processor Unit power consumption. See publication reference G 511-0133.

**3 090 heat and power characteristics vary with system power requirements.

Refer to the IBM 3090 Installation Manual Physical Planning (GC22-7074) for details.

***The power consumption of the IBM 3090 Processor Complex must be added to the consumption of the IBM 3089 to determine the total input power requirements.

Publications

| | | | |
|-----------|--|---|---|
| GA21-9465 | IBM 3180 Display Station Introduction and Pre-installation Planning Manual | GA27-3153 | IBM 3287 Printer Component Description |
| GA23-0113 | IBM 3270 Information Display System Features Description | GA27-3200 | IBM 3863, 3864 and 3865 Modems, Introduction and Site Preparation Guide |
| GA26-1657 | IBM 3370 Direct Access Storage Description | GA32-0021 | IBM 3803-2/3420 Magnetic Tape Subsystem Description |
| GA27-2849 | IBM 3270 Information Display System Configurator | GA32-0041 | IBM 3480 Magnetic Tape Subsystem Introduction |
| GA27-2787 | IBM 3270 Information Display System Installation Physical Planning | GA33-3057 | IBM 3279 Display Station Operator's Guide |
| GA27-2890 | IBM 3278 Display Station Operator's Guide | GC31-2551 | IBM 4224 Printer Product and Programming Description |
| GA27-3150 | IBM 3287 Printer Models 1 and 2 Operator's Guide | Information on the IBM 3089, IBM 3092 and IBM 3097 is to be found in the IBM 3090 Processor Unit publications listed in the companion publication reference G511-0133. | |

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G511-0134-2(05/87)